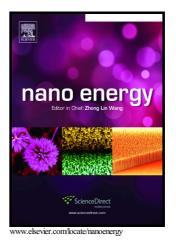
### Author's Accepted Manuscript

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# PII: S2211-2855(17)30089-7 DOI: http://dx.doi.org/10.1016/j.nanoen.2017.02.021 Reference: NANOEN1797

To appear in: Nano Energy

Received date:15 November 2016Revised date:8 February 2017Accepted date:13 February 2017

Cite this article as: Jiaqi Cheng, Xingang Ren, Hugh L. Zhu, Jian Mao, Chunju Liang, Jiaqing Zhuang, Vellaisamy A.L. Roy and Wallace C.H. Choy, Pre- and post-treatments free nanocomposite based hole transport layer for hig performance organic solar cells with considerably enhanced reproducibility *Nano Energy*, http://dx.doi.org/10.1016/j.nanoen.2017.02.021

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#### Pre- and post-treatments free nanocomposite based hole transport layer for high performance organic solar cells with considerably enhanced reproducibility

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#### Abstract

In this work, we demonstrate a one-step room-temperature ethanol-processed nickel oxide (NiO<sub>x</sub>):electron acceptor nanocomposite functioning as efficient hole transport layer (HTL). Specifically, one-step refers to the formation of the nanocomposite HTL films without extra steps of pre-treatments of ITO nor post-treatments of HTL films, and thus considerably reduce the fabrication complexity and cost. By varing the concentration of the electron acceptor, 2,3,5,6-tetrafluoro-7,7,8,8-tetracyanoquinodimethane (F4-TCNQ), the work function (WF) of the nanocomposite films can be widely tuned from 4.73 eV to 5.30 eV, which favors its use for photovoltaic applications of organic donor materials with different highest energy occupied molecular orbital (HOMO) energy levels. Organic solar cells (OSCs) have been fabricated by using the NiO<sub>x</sub>:F4-TCNQ nanocomposite as HTL. The optimized average power conversion efficiency (PCE) of

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